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THIS ISSUE'S CIRCULATION: 7,012

#

20

18 January 1985

## A Contribution To Bach's Tricentennial

by Brian Jay Wu

MusicWorks is a program from Hayden Software (600 Suffolk St., Lowell, MA 01854) that allows you to input music to a Macintosh using musical notation, and to then play back the song. No additional hardware or software are needed.

It's important to remember that the

Macintosh hardware is limited to producing sound for a maximum of four voices at once. A "voice" corresponds to one continuous melody of single notes. Thus, in order to play a C major chord (C, E, and G), one would have to use three of the four voices, one voice for each note. It's clear the Macintosh won't handle most of the Chopin works or a symphony by Beethoven, since those pieces often use several dozen voices at once. However, most beginning and intermediate keyboard pieces can be done in four voices.

MusicWorks scores are input one voice at a time. The choice of notes runs from 16th

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notes to whole notes, so 32nds and ornamentals are out. Following a 16th by another 16th in the same pitch is useless since the machine (hardware or software, I don't know) cannot distinctly stop and then start notes cleanly enough (although placing a rest between the two can help). Forget about double sharps and double flats, or devices like triplets (as exemplified by the song "Laura", that Johnny Mercer favorite). The program can't hack it either audibly or notationally.

MusicWorks does not support text in a score, either comments or lyrics, which means you cannot generate a "real" score with notations like *Adagio* or *alle Breve*. Also forget about repeat bars and codas and first/second endings. That leaves about the most primitive level of notation possible, but a large variety of music can still be transcribed!

The above restrictions make it clear that Baroque keyboard pieces are ideal for this program, since they typically use few voices and aren't too long. That's important because the length of a MusicWorks song is limited to 64 measures of 4/4 time. Apparently the entire piece is kept in memory.

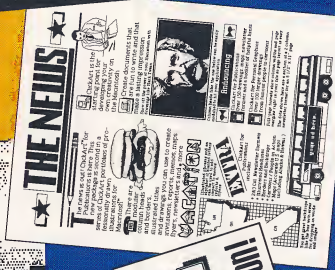
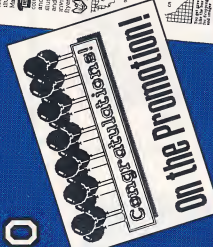
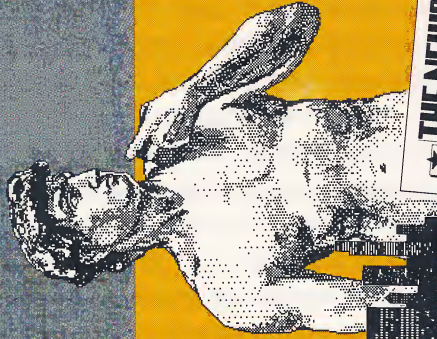
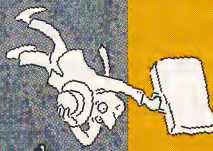
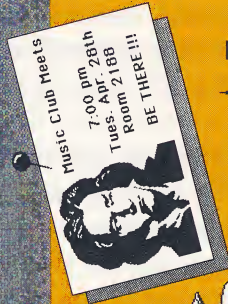
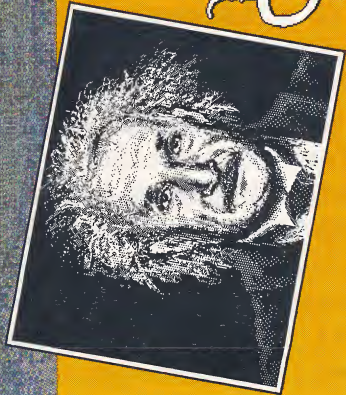
As a test of MusicWorks, I attempted to enter the fifteen Bach Two-Part Inventions. That adventure illustrated several strengths and weaknesses of the program.

The Bach Inventions are relatively easy to enter, taking on the order of thirty minutes each to input using MusicWorks' staff editor. The program allows you to graphically enter and move notes on a music staff, just as you would expect, and assists you by showing the name of the note as you enter it. For example, "6th octave, C". Editing is easy because copy, cut, and paste are supported. The program also offers an alternative to standard notation (a strange and unique "grid" mechanism), but it seems more interesting than useful. I suspect most users will simply use musical notation for entering a song.

MusicWorks is clever enough to automatically determine rests and other matters of timing.



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Moving notes up and down by a half step as well as an octave works well. There are even some neat little devices to flip notes horizontally and vertically. Well done! Obviously, thought went into the editing section.

Not so well done are the limitations on the different meters. For example, Invention 3 is in 3/8 time, but MusicWorks doesn't support 3/8 time! The closest thing it supports is 3/4 time, so I had to enter Invention 3 in 3/4 time, with the stipulation that every note was "doubled": a 16th note in the original score was transcribed as an 8th note, for instance. As another example of MusicWorks' meter problem, Invention 12 is written in 12/8 time. I had to transcribe it in 6/8 time, which meant that for every measure in the original 12/8 score, I had to generate two measures in 6/8 time. To transcribe Invention 10, which is in 9/8 time, I had to use 6/8 time, and for every two measures in the real score, three were generated in the MusicWorks score. And I thought the computer was supposed to do the hard work!

Subtle but important features of music notation (such as default accidentals within the same measure, or the changing of staff notes) are not supported. If a C sharp is recorded in once voice, then technically any C in the same measure in another voice should default to C sharp also. The program will check for consistency across one voice, but will not cross-check against the other voices. That makes it difficult to ensure that your score is faithful to the original, particularly if you had to do a translation from the real meter to one that happens to be supported.

Really frustrating are MusicWorks' "features". For example, the program insists on forcing the technically correct note, even at the expense of notational and stylistic aesthetics. For instance, consider a trill in the key of D (where F is automatically sharp) consisting of a long repetition of the notes E sharp (actually F natural) and F (which is sharped). If you input the trill, MusicWorks cleverly recognizes that E sharp is actually F natural,

and so enters it as that. Then, when you enter the F, it recognizes that you are in the key of D and places a sharp sign on the F (because the previous F was natural). Then, when you enter the *second* E sharp, MusicWorks again forces an F natural! Do that several times and the result is a horrible mess with sharps and naturals floating everywhere. If the program had let me enter what the composer wrote, namely E sharp, and didn't insist on being technically correct, the score could have been kept as clean and neat as the original.

As another example of this tendency towards correctness, the program will take two notes of the same pitch tied together (indicating notationally separate notes, but audibly a single note) and generate the corrected "real" note. Tying two quarter notes together will generate a picture of a half-note, again carrying the score further away from the original.

If the key signature is sharps (such as the key of G or A), MusicWorks will not allow you to enter any flats (it figures out what the equivalent is in sharps). The reverse is true if the signature has flats. Again, one is unable to enter scores as the composer wrote them. This means the score physically looks different from the original, which can make debugging compositions really difficult.

I can understand the technical reasons why MusicWorks forces the conversions, since otherwise it would require a representation of the score that included the "real" note as well as the "represented" note, and that would complicate the internal format of the music. Still, it is disturbing not to be able to input music and remain graphically faithful to the original. It also seems anomalous to coerce J. S. Bach to fit MusicWorks.

When the program first loads, strange and bizarre sounds can occur. That happens about every other time I run MusicWorks. Don't worry, it's just random values in the sound buffers. Simply hit the dialog buttons PLAY and then STOP, and the noise

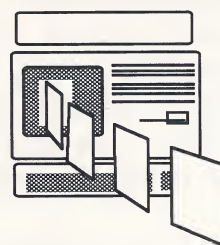


stops. Another minor problem is that, although MusicWorks can create notes across eight octaves, the unaided sound output of the Macintosh cannot reproduce the lowest notes. (You can hear them through headphones just fine, however.) The eighth octave is not reproduced correctly. The notes simply fail to match the correct pitch. If you do run the Mac sound output through headphones, you had better set the volume to the lowest possible setting or risk loss of hearing. If you are running the output through large amplifiers, be certain you begin with low gain settings or you risk destroying your speakers, as well as losing your apartment lease.

MusicWorks can print a score, but the output is poor. For some reason, it insists on printing blank measures trailing on the right side of the score. A minor problem, but irritating. Worse is that the program prints the score in very large graphic characters. As a result, the printout contains only two measures per line on the average, and only four lines (or staves) per page. To print a MusicWorks score takes roughly five to six times as many pages as the original. That certainly encourages "paperless composing", but sometimes it's nice to refer to printouts.

Since there are work-arounds, annoying though they may be, MusicWorks' limitations are not fatal, if all you want is your Mac to play your favorite piece. If you are even only slightly interested in music and the Mac, then the \$79.95 suggested retail price tag is quite attractive, and you really cannot go wrong buying the program. But if you are serious about music or interested in actually transcribing scores, there is no way the product will satisfy you. Do not expect MusicWorks to do everything it should.

I compliment Hayden on the excellent documentation, which includes an introduction to the technical aspects of music. There are some neat little touches, like the "trails" desk accessory (a small doodling program that makes cute pictures). MusicWorks supports some interesting synthesizing tools for changing sound envelopes, so it's an excellent



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introduction to electronic music. However, I am unable to clearly distinguish between the "flute", "trumpet", and "organ" options. There is some good stuff here for those of you who are interested in learning the rudiments of electronic music. Indeed, this is an excellent program for learning about music in general.

I have to wonder, though, at what expense to fundamentals did the MusicWorks authors add trinkets? I'd rather have support for all time meters plus a way to stop the program from being so doggedly correct, rather than be able to play with a synthesizer. But then, I'm not a composer, I just like hearing some good tunes.

*Editor's Notes: Seems to us that MusicWorks included the grid input option as a kind of "keyboard", so users who aren't adept at working with musical notation can still enjoy the program. Brian has kindly placed his arrangements of the fifteen Inventions in the public domain, and has sent us a copy of his files, but please don't send money or blank disks asking us for a copy until we finish our project to figure out a good way to distribute all of the free software our readers have been sending in. -MG* ☐

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## Quickly Unloading Lisa Folders

Imagine you have a Lisa folder you want to move (not copy) to a diskette. Which is faster: dragging the folder off the hard disk onto the floppy, or duplicating the folder, moving the duplicate to the floppy, and then trashing the original?

We made some tests using 2.0, and found we could drag a folder containing 12 blocks of data completely off a Profile and onto an empty floppy in about 17 seconds.

If we instead just duplicated the same folder and dragged the new copy to a blank diskette, the move took only 15 seconds, but another 6

seconds were necessary to move the original into the wastebasket, and another 5 seconds were needed to flush the trash, so the total time of 26 seconds seemed to indicate a direct move was quicker by far (and with a lot fewer steps).

But to our surprise, we tried the same comparison with a much larger folder and found that the simple method was no longer the quickest. For example, dragging a folder of 582 blocks off a Profile and onto an empty diskette took 16 minutes and 45 seconds. But if we instead duplicated the folder and moved the copy, we were done in just 7 minutes. Another 11 seconds were necessary for moving the original into the wastebasket, and we could then flush the trash in only 2 minutes and 10 seconds. The total time came to 9 minutes and 22 seconds, 44% faster than the direct move method for the same folder! ☐

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## Subscriber Interests And Activities

*Mike DeWalt, Bothell, WA:* I work as a software engineering consultant for Boeing. In addition to using the Macintosh to learn languages like Modula, I use ThinkTank for doing documentation, such as fault trees, for certifying software for the FAA.

*Harold W. Akers, North Huntingdon, PA:* I have used Lisa 7/7 software in my sales business to create invoice forms, templates, customer quotations, general ledger files, checkbook documents, and check template forms. With a little creative thinking, I have been able to convert all my business activities and bookkeeping procedures onto the Lisa. This has cut my paperwork time in half, freeing me to create new ways of using Lisa in my business. I have gained so much extra time that I was able to accept a part-time computer programming teaching job in a local junior high school.


*Ronald I. Rothenberg, Flushing, NY:* I am



using MacWrite and MacPaint as aids in writing my fourth book.

*L. Mawby, Suttons Bay, MI:* I've been using MacWrite and MacPaint for our winery's letter writing, putting out our newsletter (the mailing list is still maintained on our Apple II), MacPainting neat and readable signs for around the public areas of the winery (hours, no smoking, etc.), and using Multiplan for financial forecasting and cost accounting. I got excited about the potential of FileVision for mapping orchard/vineyard blocks and set up a simple inventory map of the winery: click on a barrel icon and get info on present and past contents of the barrel, highlight all barrels that have 1984 Chardonnay in them and that also held 1980 Vignoles, and so on.

*Douglas A. Coleman, Portland, OR:* Our company is an Apple value-added reseller and dealer. Plans are to use a Mac as the primary console on the lumber mill process control systems we build.

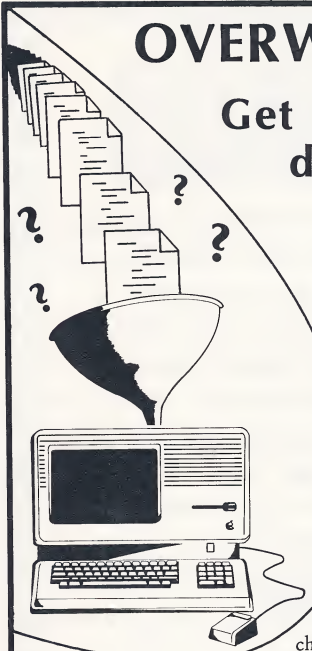
*David E. Johnston, Baton Rouge, LA:* I am a dentist, and I use LisaList to keep track of which patients are due for their regular checkups, LisaWrite for my local dental association newsletter and to keep up my correspondence with labs, patients, and fellow dentists, and LisaCalc in place of accounting software. (I have seen accounting software on other machines, but I prefer doing my books with a spreadsheet. That way, if I have a sudden flash of insight and want to change or add something, it's easy. With the accounting software I have seen, if you don't like the way they do something, that's just too darn bad.) 

## Copy II Mac Earns A Thumbs Up

The various copy protection schemes on our Macintosh disks have been driving us crazy, so our eyes really lit up when a package containing Copy II Mac recently arrived from

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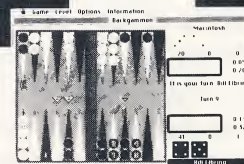
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Copy II Mac is a program that lets you duplicate all or portions of copy protected Macintosh disks. (Of course, you're only supposed to make backup copies of your own software for your own use, not to sell or give away.) Two copy options are provided: a format-while-writing bit copy that can't run under MacWorks, but which seems to successfully bypass the protection scheme of any Macintosh software product, and a faster sector copy version that can copy some protected disks, but which is intended mainly for copying standard, formatted Mac disks. The documentation claims the sector copy option is MacWorks compatible. Copy II Mac itself is not copy protected.

The program is simple and straightforward to use, and can copy any range of tracks in either the bit or sector mode. It also supports extra memory and external drives to help reduce disk swaps. However, using a minimum Macintosh might be a good idea, since the configuration sometimes seems to affect the copy process. For example, one of our readers has reported that Macintosh Pascal can only be duplicated by Copy II Mac when using just the internal drive. On the other hand, the same reader also reported that Mouse Stampede wouldn't copy at all, but it duplicated just fine for us when we used the bit mode. (The sector copy never complained while doing Mouse Stampede, but the results wouldn't boot. It was interesting to find that the good copy made with the bit mode was also protected, and could itself be copied only by again using Copy II Mac.) The documentation for Copy II Mac mentions that reversing direction, such as going from the external drive to the internal, sometimes helps overcome copy errors. When we used a 128K Mac with only an internal drive, the sector copy would buffer eight tracks per disk swap. A bit copy buffers only four tracks per swap, for a total of twenty swaps for all eighty tracks.

A listing included with our Copy II Mac,

dated November 20, 1984, shows over fifty Mac packages, from 1stBase to Zork, that the product can successfully copy. We're interested in hearing from any users who have found software that Copy II Mac can't copy.

An extra program called MacTools is supplied on the same disk that contains Copy II Mac. MacTools is a disk and file utility that provides a number of handy functions, but most of them (such as copy files, copy disk, rename files, rename disk, format disk, and delete files) are already supplied by the Finder and standard Mac software. Some unique functions in MacTools include the ability to verify disks as error free, options to set the visible/invisible and protect/unprotect bits for files, and a ViewEdit menu option for inspecting and patching any file or disk block. While MacTools is a handy kind of all-in-one utility, especially for developers, it will probably be viewed by the casual user as primarily a curiosity.

Copy II Mac is simple to use, works as advertised, and just one damaged master disk with no backup can easily make its \$39.95 price tag worth the investment, so we're giving it a Thumbs Up. However, we do have four minor complaints.

First, the documentation is not well packaged. The disk arrived along with two booklets, a two page list of copyable products, and a two page ViewEdit supplement, all shrink wrapped but loose inside a cardboard cover. The cardboard could have at least been folded to form a pocket to help store all that paper.

Second, we were expecting but never found a discussion or description of copy protection schemes and how Copy II Mac overcomes them. A little user education might be fun.

Third, we noticed that the program will overwrite a destination disk without hesitation. It would probably be safer if, like Apple's own standard disk copy utility, the program would first pause and verify that the user really wants to clobber a disk if it happens to already contain files.



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Fourth, MacTools would be a lot more useful if, instead of duplicating so many Finder functions, it instead offered a utility to compare files. That would certainly be handy for us, because we're constantly discovering multiple copies of public domain software from two different sources, and find ourselves wondering if two programs with the same name and icon are really identical versions. ☐

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## Still Advertising On A Shoestring?

In *Signal #18*, we described how Macintosh product vendors could arrange for a free listing in the upcoming *Macintosh Buyer's Guide*. A similar opportunity has since surfaced in the form of *The Complete Macintosh Sourcebook*, a guide being compiled by Pat Ryall, who was the editor of *ST. Mac*. The *Sourcebook* will feature reviews and descriptions of hundreds of Mac products, and is scheduled to be published by InfoBooks in the spring. To be included, send your product to Box 1018, Santa Monica, CA 90406. ☐

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## MS-BASIC Finally Arrives At *Signal*

For some unknown reason, we had to make a dozen frustrating phone calls to four different people over a ten week period, but we finally managed to get Microsoft to ship us a copy of their new 2.0 BASIC. (They're at Box 97200, Bellevue, WA 98009.) As far as we can determine, \$150 is still the suggested retail price.

We deliberately avoided 1.0 all this time because we knew that 2.0 was going to provide facilities for windows and menus and dialog boxes and all the rest of the graphics goodies for building Mac-style programs. Now that we've had a few days to check out 2.0, we're not sorry we waited. Microsoft BASIC

is an excellent implementation of a programming environment, and we're giving it as enthusiastic a Thumbs Up as we did for Macintosh Pascal, back in *Signal #18*.

(Because of the considerable elegance of Pascal compared to BASIC, we still recommend the Macintosh Pascal environment as the preferred tool for teaching or learning a first programming language on the Mac, or for prototyping an application that requires full Quickdraw access or that will eventually be compiled. Microsoft BASIC is the way to go if what you want to do is hack around, or quickly get something up and running, or maybe write a scientific or business data processing application.)

While we have a number of projects planned that should fully exercise the product, our experience with Microsoft BASIC to date totals just a few hours. Still, we've already made a few interesting discoveries.

Our initial surprise came when we first opened the packaging. The disk seal warning about our license agreement was already broken! The box was shrink wrapped and looked like new finished goods, but perhaps it was just a used evaluation copy that Microsoft had repackaged before shipping it out again.

We were also surprised and pleased to find that BASIC isn't copy protected. However, we noticed it's distributed with a 1.1 Finder, and all our disks happen to have a 1.1g Finder. BASIC also now comes in two flavors, a decimal BCD version compatible with the old 1.0, and a binary IEEE version for faster floating point calculations. When we copied the decimal 2.0 BASIC from its 1.1 disk to one of our 1.1g disks, we were amazed to see its icon change from the new 2.0 flowchart design back to the old 1.0 icon! Apparently, the icon is the only thing that actually changes, since BASIC still executes properly with all its new 2.0 features. However, we have noticed one other peculiarity when trying to load old 1.0 programs: they sometimes don't appear in the mini-finder for opening a



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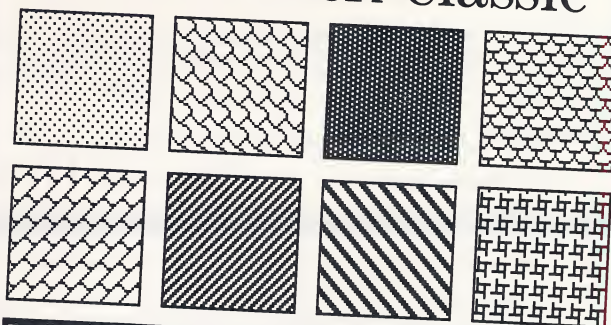
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file! We have to click directly on the 1.0 program's icon to start it up. Once it's been re-saved under 2.0, everything's fine, except its icon happens to have one pixel blanked out! These strange little quirks were news to Microsoft's customer support. Has anyone else noticed these problems?

Speaking of icons, we don't like the way it's impossible to tell whether an icon represents a program saved as text, compressed, or protected.

We like the clever way BASIC's list window can be enlarged to full screen by double clicking on the title bar. That should be a standard feature for all Mac software. On the other hand, the secondary list window seems a clumsy way of allowing multiple views of the same text. We prefer Lisa's approach of letting windows be split into multiple panes.

Now, if Microsoft could just put together a *compiler* for BASIC, we would really see a

spurt in the number of available Mac software products. 

## This Month's Mailbag

### *I Can't Type My Own Name*

I use my Macintosh about two hours every day for word processing. It works fine for about an hour at a time, and then it starts doing nonsense. With the help of a dealer, I traced the problem to loose keyboard cable connections. The problem occurs even when I do not move the keyboard or the cable. This problem is not only annoying, it also caused the destruction of several disks because of improper input from the keyboard. Can the cable somehow be soldered in its place to avoid loose connections?

Another problem is that I use the Mac in several languages and need more special symbols than presently available. Most urgently I need to use an accent like é, but on the letter c, and an accent like ê, but on

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the letters c, s, and z, and with the accent mark upside down. This problem forced me to type this letter on an ordinary typewriter instead of on the Macintosh.


Dušan Djurić, College Station, TX

*The connector we hate is the one for the mouse. It sticks out like a sore thumb and gets smashed every time we move the machine. We recommend being sure you've really found the problem before taking action as drastic as soldering. After all, loose connections that act up even when nothing is moved, and only after an hour or so, just don't sound very plausible. Let's hope we hear from a font designer who has just the characters you need. You might also consider defining your own font using the Font Editor that's available in the Macintosh Software Supplement, and also from most user groups. Note that the Imagewriter is capable of downloading and printing custom characters, but that's only useful when it's being driven by streams of ASCII characters with all the necessary imbedded control codes. -MG*

#### **More Untypeable Characters**

Your reply to a letter in *Signal #19* stated that the cloverleaf command character is not supplied by Apple with any of the standard fonts. That is not correct. While not available from the keyboard, the cloverleaf is supplied, as are a check mark and an apple. They are in the Chicago font, in positions 17, 18, and 20. They can easily be generated by any programming language and saved in the scrapbook for later use.

Donald Leeper, Buena Park, CA


*Thanks for your tip. We may have implied it, but we didn't actually say the character isn't in a font, only that there isn't a way to output the symbol with the configuration shipped by Apple (in other words, without a programming language). As long as we're on the subject, we also think the key caps desk accessory would be a lot more useful if it had controls for the next and previous installed font and the next and previous point size for a font, to make it easier to explore and display special font characters. -MG* 

## **A Version Of Klondike Solitaire Surprises Us**

When Klondike Solitaire first arrived from Computing Capabilities Corporation (465-A Fairchild Drive #122, Mt. View, CA 94043), we were very skeptical. After all, how could a game of solitaire on the Macintosh be any more entertaining than simply using a real deck of cards? Well, it only took about a minute of playing this particular version of Klondike on the Mac before we realized how shortsighted we were.

This implementation of Klondike makes the player compete against the clock. Simply by subtracting points when the player is idle (points are also lost for poor moves), the program becomes a rather fast moving and challenging action game that puts a premium on skill. It becomes surprisingly addictive.

The game is well designed for the Mac environment. All card turning (one or three at a time) and moving is handled by the mouse. Only legal moves can be made. Naturally, all shuffling and dealing is automatic. The program does a good job of cleverly managing card positions, so that a complete but still easy to read "tableau" fits nicely on the Mac's small screen. (Since cards often overlap quite a bit, it's sometimes tough to tell the red suits from the black. Game programs should really thrive once a color Mac appears.) Up to four players can compete, and the program maintains the top ten scores. The sound effects are optional, and a help menu controls three windows of rules and scoring information, along with an option to reveal hidden aces.

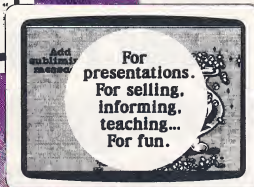
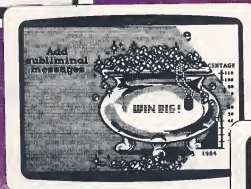
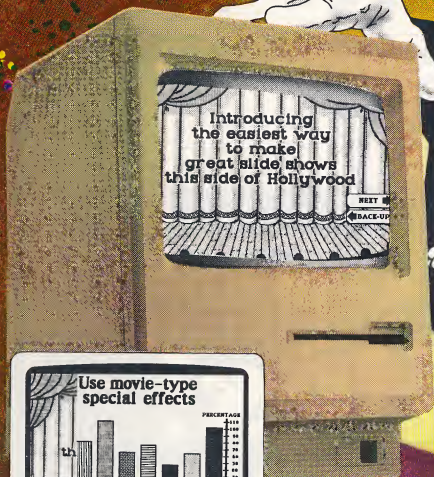
Even though we would prefer to see this Klondike Solitaire selling at around \$19.95 instead of the current \$39.95 suggested retail, we've gotten hooked on the game and always have a fun time playing it, so we're going to give it our Thumbs Up recommendation. 



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